TECHNOLOGY DEVELOPMENTS FOR EUROPEAN MARS ROBOTIC EXPLORATION PREPARATION

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ABSTRACT

A new component of the European Aurora exploration programme was established at the Council of Ministers in December 2008, called the Mars Robotic Exploration Preparation (MREP) Programme. The MREP programme objective is to build, in the medium term, a European Robotic Exploration Programme, by concentrating first on Mars exploration and by making use of international collaboration.

The general approach for the programme is to consider a Mars Sample Return (MSR) mission as a long term objective and to progress step by step towards this objective through short and medium term MSR-related technology developments, which are validated during intermediate missions.

This paper will present the aims of the MREP programme together with the latest technology plan and roadmaps for the required technology developments in order to achieve the long-term objective of an international MSR mission. Specific areas of investment in the MREP programme include precision landing, sample-fetching rover capabilities, sample containment, Mars orbit rendezvous and capture and Earth return capsule technologies.

An in-depth analysis of the state-of-the-art in European technologies in these and other technology themes relevant to Mars robotic exploration will be given and linked to the current technology development plan within the framework of MREP.